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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/849,345

05/19/2004

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01/04/2005

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EXAMINER

TRAN, THIEN F

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 01/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/849,345	Applicant(s) BURGENER ET AL.	
	Examiner Thien F. Tran	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14-42 is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 6 and 8-12 is/are rejected.
- 7) ☒ Claim(s) 4, 7 and 13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>08/19/2004</u> . | 6) <input type="checkbox"/> Other: ____.  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-3, 5-6, 8-12 are rejected under 35 U.S.C. 102(a) as being anticipated by Yamamoto et al. (EP 1215310A1).

Yamamoto et al. discloses the claimed persistent p-type group II-VI semiconductor material comprising a thin film 6 of a single crystal group II-VI semiconductor comprising atoms of group II elements and atoms of group VI elements, wherein the group II-VI semiconductor is doped with a p-type dopant (see table 1), wherein the p-type dopant concentration is sufficient to render the group II-VI semiconductor material in a single crystal form, wherein semiconductor resistivity is less than about 0.5 ohm.cm, and wherein the carrier mobility is greater than about 0.1 cm<sup>2</sup>/V.s .

Regarding claim 2, the group II elements are selected from zinc, cadmium, alkaline earth metals, and mixtures thereof.

Regarding claim 3, the group VI elements are selected from oxygen, sulfur, selenium, tellurium, and mixtures thereof.

Regarding claim 5, the resistivity is less than about 0.1 ohm.cm.

Regarding claim 6, the resistivity is less than about 0.01 ohm.cm.

Regarding claim 8, the carrier mobility is greater than  $0.5 \text{ cm}^2/\text{V.s.}$

Regarding claim 9, the carrier mobility is greater than  $4 \text{ cm}^2/\text{V.s.}$

Regarding claim 10, the p-type dopant concentration is in the range from about  $10^{16}$  to about  $10^{22} \text{ atoms/cm}^3$ .

Regarding claim 11, the p-type dopant concentration is greater than about  $10^{16} \text{ atoms/cm}^3$ .

Regarding claim 12, the p-type dopant concentration is in the range from about  $10^{17}$  to about  $10^{19} \text{ atoms/cm}^3$ .

***Allowable Subject Matter***

Claims 14-42 are allowed.

Claims 4, 7 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: prior art references do not teach or render obvious a persistent p-type group II-VI semiconductor material comprising a thin film of single crystal II-VI semiconductor doped with a p-type dopant, wherein the p-type dopant is selected from the materials as claimed in claim 4.

Prior art references do not teach or render obvious a persistent p-type group II-VI semiconductor material comprising a thin film of single crystal II-VI semiconductor, wherein the resistivity is less than about  $0.001 \text{ ohm.cm}$ .

Prior art references do not teach or render obvious a persistent p-type group II-VI semiconductor material comprising a thin film of single crystal II-VI semiconductor, wherein the group II-VI semiconductor material is deposited as a thin film on an amorphous self supporting substrate surface.

Prior art references do not teach or render obvious a persistent p-type zinc oxide comprising single crystal zinc oxide that is doped with arsenic having the properties as claimed in claim 14.

Prior art references do not teach or render obvious a persistent p-type zinc oxide comprising single crystal zinc oxide that is doped with antimony having the properties as claimed in claim 27.

Prior art references do not teach or render obvious a persistent p-type zinc oxide comprising single crystal zinc oxide that is doped with a p-type dopant selected from copper oxide, antimony oxide, bismuth oxide and has the properties as claimed in claim 40.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thien F. Tran whose telephone number is (571) 272-1665. The examiner can normally be reached on 8:30AM - 5:00PM Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2811

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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December 21, 2004

  
**THIENTRAN**  
**PRIMARY EXAMINE**